

24. ANACHORESIS OF EARTHWORMS

(With a plate & a text-figure)

INTRODUCTION

The present study was undertaken (1) to examine how far three different species of earthworms exhibit their individualities in forming the burrows in the soil of similar nature and their work output; (2) to observe the nature of burrowing movements while attempting to enter the soil and the way in which they draw themselves into the soil; and (3) to note the movements in a burrow.

MATERIAL AND METHODS

Three locally available earthworms, *Pheretima elongata* E. Perr, *Lampito mauritii* Kinberg and *Pontoscolex corethrurus* Fr. Mull, were collected from fields and maintained in the laboratory in troughs filled with garden soil. Blocks of 10×10×110 cm. were prepared by kneading the soil with sufficient amount of water. Individual worms were left on each block covered with small Petri dish in order to prevent the worm moving away from the block and to initiate burrowing. After 12 hours the block was carefully sliced both transversely and vertically and numbered in X and Y axis to trace the actual path of the worm and these pieces were dried at 110°C after removing the worm. Five per cent vinyl acetate in acetone was introduced into the holes by means of rubber teated pipette with a fine nozzle. After polymerization of the vinyl acetate, casts were collected by dissolving the block in water and the pieces were washed in running tap water. The tubular pieces thus obtained were glued in the same way they were in the blocks with synthetic resin adhesive 'Fevicol' (Pidilite Industries Pvt. Ltd., Bombay).

But for the haphazard movement of the worm, the entire block could have been used in introducing the vinyl acetate into the track of the worm. As this was not possible, the blocks had to be sliced in order to get the cast of entire track of the worm.

The average diameter of the bore and the bore and the angle of entry into soil from surface were measured with the help of these casts. From these data, the work output of each was calculated using the equation

$$W = \frac{\pi^2 r l d g}{2}$$

Where W = work done, r = radius of the burrow cross section, d = density of the soil material, l = length of the burrow track, g = acceleration due to gravity of the place where the burrow is made

In order to examine the movements of the worm in a burrow the following experiment was conducted. One per cent agar (Sarabhai M. Chemicals, India) gel with 1% cellulose (Karl Schleicher and Schull., W. Germany) was prepared by adding the mixture slowly into boiling water with constant stirring. The thickened gel was chilled in the refrigerator in 500 ml beaker. A small depression was made on the surface of the gel and the worm was held in the hand in such a manner that the anterior tip of the worm came into contact with the depression on the gel surface. As the worm advanced in the medium the characteristic movements of the prostomium and anterior segments to make way through the medium were observed through the transparent gel. Application of water soluble paint to the posterior tip of the worm would leave the trail along the path as it moved in the gel.

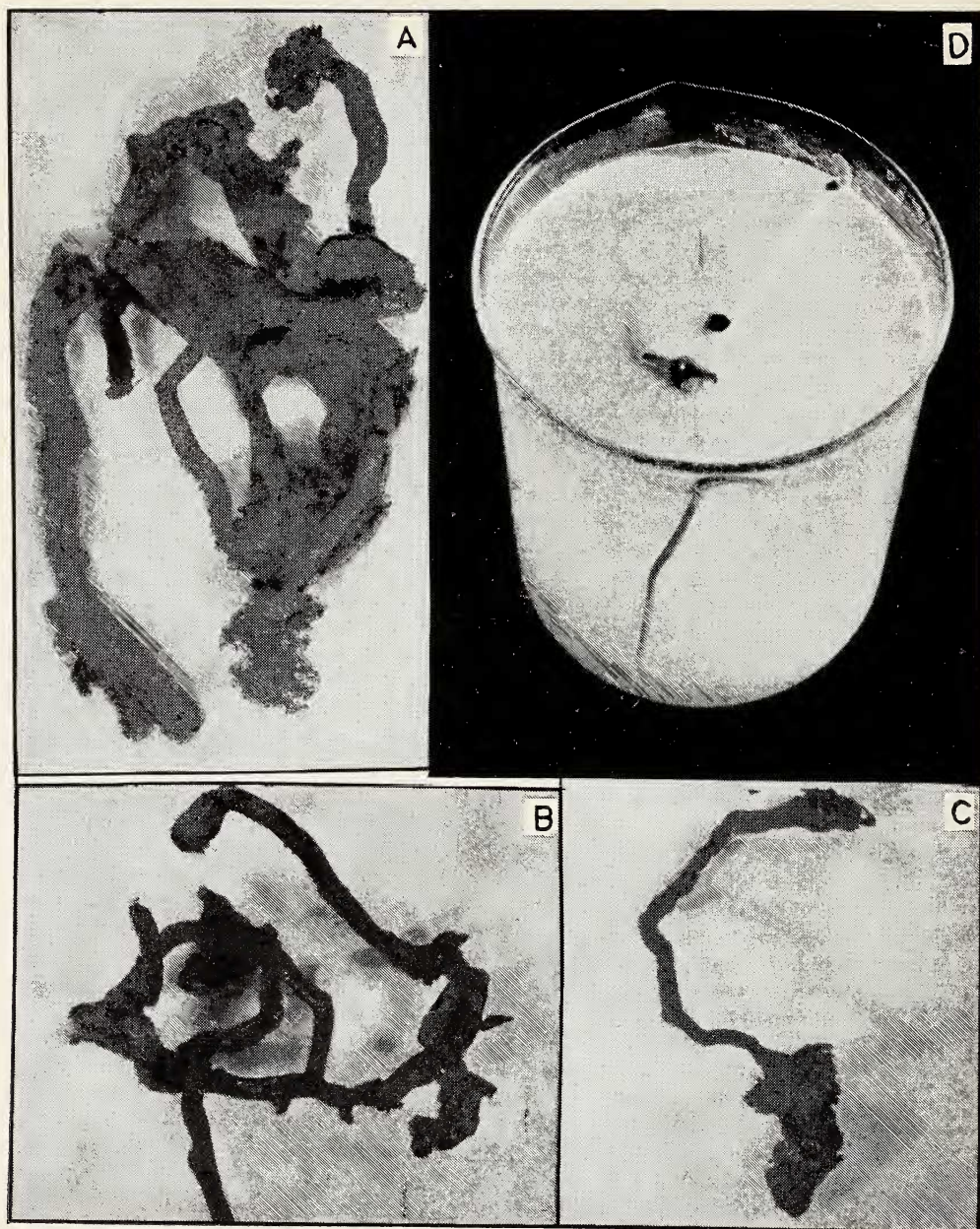


Fig. 2. Burrow casts of earthworms—A) *Pheretima elongata*; B) *Lampito mauritii*; C) *Pontoscolex corethrurus*; D) Agar cellulose gel preparation showing burrowing of *Pontoscolex*.